**REACT**

**WEEK-6 HANDSON-1 EXPLANATION**

**1. What Is SPA? Benefits of SPA:**

Single Page Application:

A Single Page Application is a web app that loads only one HTML page and dynamically updates content without the need to reload the whole page.

Benefits of SPA:

Quicker load times after the initial loading

Better user experience with smooth transitions

Fetching or AJAX-based efficient data loading

Reduced load on the server due to client-side rendering

**2. Define React and Identify its Working**

React:

React is a JavaScript library that Facebook developed for building user interfaces, with a specific focus on single-page apps.

How React Works:

Maintains a virtual DOM (copy) of actual DOM

When changed, the component state gets updated with an updated version of the virtual DOM

Old and new virtual DOM comparisons happen.

Only changed part is being updated in the real DOM for better performance.

**3. Differentiate SPA from MPA**

SPA (Single Page Application):

No page reloads

Faster after the initial load

Uses client-side routing

Dynamic data fetching

More complex SEO implementation

MPA (Multi Page Application):

Reloads the entire page on navigation

Slow compared to SPA

Uses server-side routing

Every request returns a full HTML page

Easy to optimize for SEO

**4. Advantages and Disadvantages of Single Page Applications:**

Advantages:

Quick and responsive

Minimal load on servers

Fluent navigation

Reusability of components

Disadvantages:

SEO optimization quite challenging

Initial load time quite high

Complex to manage browser histories

There are security risks like XSS, which must be guarded carefully.

**5. Explain About React**

React-a component-based JavaScript library for building dynamic and interactive user interfaces. It was mainly used for the development of single-page applications. React follows a declarative approach which allows web developers to build reusable components. It features one-way data binding and employs a virtual DOM for better performance.

**6. Define Virtual DOM**

Virtual DOM is a lightweight representation of the actual DOM in JavaScript. Instead of directly accessing the real DOM, React creates and updates the virtual DOM. It compares the new and old virtual DOM and applies only the changes to the real DOM to enhance the efficiency and speed.

**7. Features of React**

JSX enables one to write HTML like code in JavaScript

Component-based architecture enables reusability

Virtual DOM boosts rendering performance

One-way data binding ensures predictability in data flow

Declarative UI for clearly displayed and easily understood coding

Hooks for state and life cycle in functional components

Strong ecosystem with associated libraries like Redux and React Router.